

IN THE UNITED STATES DISTRICT COURT
NORTHERN DISTRICT OF GEORGIA
ATLANTA DIVISION

JOHNNY BATES and
PATRICIA MIDDLETON BATES,

Plaintiffs,

v.

MICHELIN NORTH AMERICA, INC.,

Defendant.

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CIVIL ACTION FILE

NO. 1-09-CV-03280-AT

**PLAINTIFFS' RESPONSE TO
DEFENDANT MICHELIN NORTH AMERICA, INC.'S
MOTION TO EXCLUDE TESTIMONY OF TROY COTTLES AND
DON LEE REGARDING FINITE ELEMENT ANALYSIS**

Michelin seeks to exclude the Finite Element Analysis (FEA) that Don Lee conducted, and on which Troy Cottles relies in support of his opinions regarding tire design. It is telling that Michelin seeks to exclude this study. On one hand, Michelin files a motion to *Daubert* Mr. Cottles for not doing *enough* testing in support of his tire defect opinions, notwithstanding that Michelin's own experts have done *no* testing to support their opinions in this case. (Doc. 204.) On the other hand, when Plaintiffs commission the same cutting-edge, computer modeling that Michelin conducts in its design own process (and which it has withheld from

production), Michelin then moves to exclude it. As explained in detail below, Michelin's motion should be denied because the FEA is scientifically sound and supports Plaintiffs' tire design opinions.

I. Mr. Cottles and Mr. Lee Are Properly Designated to Testify about Areas Within Their Expertise.

Michelin's motion deliberately seeks to confuse the Court about the different areas of expertise and designations for two of Plaintiffs' experts: Troy Cottles and Don Lee. The Court is already relatively familiar with Mr. Cottles, Plaintiffs' primary tire design expert. (*See* Plaintiffs' Fifth Supplemental Expert Disclosures, Doc. 228-19, attached as Ex. 1.) Mr. Lee is also a tire designer, but because of his extensive industry expertise with FEA, Plaintiffs commissioned him to perform a FEA and to discuss the FEA results in the case. (*Id.*)

In a classic misdirection, Michelin criticizes Mr. Cottles for not having specific FEA expertise--but Plaintiffs never designated Mr. Cottles as an expert on FEA. Instead, Mr. Lee, who has extensive FEA expertise, has handled the FEA issues in the case. Mr. Cottles has simply relied on the results of the FEA in support of his opinions, exactly as he did while a tire designer at Dunlop. Not surprisingly, **Michelin's brief is entirely silent on Mr. Lee's qualifications to testify about FEA.** Instead, Michelin prefers to criticize Mr. Cottles for his lack of FEA expertise. That is because Mr. Lee clearly has the experience and expertise

to testify about the FEA work he performed and for which he has been designated to testify.

II. Mr. Lee's Industry Experience with FEA Provides Him with the Qualifications to Testify Regarding His FEA Work.

Mr. Lee is a former tire designer with Hankook Tire. He first started with Hankook in 1990 as a tire design engineer and worked with Hankook until 2007. (Lee Dep. at 16-17, 26, collectively attached as Exhibit 2; Lee CV, attached as Exhibit 3). In his entry level position with Hankook, he designed medium-sized truck tires for the North American, European and Korean markets. (Lee Dep. at 17, Ex. 2.)

Mr. Lee was later assigned to Hankook's research department where he handled computer simulations like FEA. (*Id.* at 21.) From 1998 to 2007, he personally conducted and evaluated FEAs for Hankook as a regular part of his job duties. (*Id.* at 27.) Mr. Lee's master thesis for the master's degree he earned in 1990 was on the subject of computer simulation for design, which is a form of numerical analysis such as FEA. (*Id.* at 44.)

Mr. Lee, as a Hankook employee, also had a role in developing the Abacus software that is the industry standard for performing FEA work and was the software he used for his work in this case. (*Id.* at 84-85.) Mr. Lee has published a peer-reviewed paper on using FEA to model the effectiveness of nylon cap plies

(*See Design Elements of Steel Belted Radial Tires to Improve Belt Durability*, Hazard Information Foundation, Inc. 2010 Conference, Aug. 13, 2010, attached as Exhibit 4.), which is similar to the work he has done on this case.

As Mr. Lee explained in his deposition, FEA is a computer simulation technique that tire designers use to solve differential equations to predict how various tire designs will perform. (Lee Dep. at 60-61, Ex. 2.) In the FEA Mr. Lee conducted for this case, he compared data from a tire similar to the subject tire with data from a potential alternative design in a qualitative analysis. (*Id.* at 73.)

In inputting the information about the exemplar Laredo tire, Mr. Lee obtained a section of a sample production tire and electronically scanned it into the computer program. (*Id.* at 87-89.) That enabled him to input precise measurements of the tire's geometry. (*Id.*) He then used the Abacus FEA computer program to divide the tire model into small, technical elements in a process called "meshing." (*Id.* at 96.) Mr. Lee did this in the same manner he employed while he was at Hankook, which is also the manner in which this is done in the tire industry as a whole. (*Id.* at 100.) For the tire inputs for which Mr. Lee did not have information from Michelin, he used exemplar tire information from a peer-reviewed tire paper. (*Id.* at 104.)

After Mr. Lee successfully modeled the subject Laredo tire, Mr. Lee conferred with Mr. Cottles. Mr. Cottles provided Mr. Lee with several inputs to use when modeling attributes of Mr. Cottles' alternative design. (*Id.* at 121.) These changes include the addition of a nylon cap ply, wider steel belts, and thicker wedge. (*Id.* at 121-22) Mr. Lee then ran a comparison of the two tires through the FEA simulation. The results were then presented in his report. (*See* Lee Report, Attached as Exhibit 5.) The results from this computer model showed that the alternatively designed tire performed better than the subject tire. (*Id.*)

Mr. Lee has been designated as an expert to provide the foundation for his work and to discuss the FEA process and results. (*See* Plaintiffs' Fifth Supplemental Expert Disclosures, Doc. 208-19, Ex.1.) Mr. Cottles is relying on Mr. Lee's results to support his opinions in the case.

III. The Testimony of Michelin's Experts Supports the Admission of the FEA.

Michelin's tire expert, Joseph Grant, admitted that FEA is a tool tire manufacturers use when evaluating at significant new change in design. (Grant Dep. at 59, collectively attached as Exhibit 6.) When Mr. Grant worked at Continental Tire, Continental Tire used FEA as part of its design and development process. (*Id.* at 60.) Despite FEA's acceptance as a tire design tool, Mr. Grant has never seen Michelin produce any of the FEAs it has performed on its tires. (*Id.* at

61.) Mr. Grant has also not reviewed or seen any FEA work Michelin has performed as it relates to nylon caps or this tire. (*Id.* at 331.)

Michelin routinely uses FEA to evaluate some of the potential changes in its tire designs and in the development of tire prototypes. Charles Patrick, a former Michelin tire designer, agreed that stress and strain at the belt edge (one of the variables Mr. Lee's analysis captured) was one of the variables Michelin would evaluate to determine the likelihood of tread separation in its FEA models. (Patrick Dep. at 171-72, collectively attached as Exhibit 7.) Despite Michelin's use of FEA in its evaluation and design of tires, Michelin has produced none of its FEA-related studies in discovery. Its own experts have also not used FEA in support of their opinions.

IV. Michelin's Reliance on *Peterson v. Daimler Chrysler Corporation* Is Misplaced.

Michelin's primary argument is that the Court should exclude the FEA because another court has done so. This argument baldly misstates the *Peterson v. Daimler Chrysler Corp. et al.*, No. 1:06-CV-00108-TC (*N.D. Utah*, June 22, 2011) case and its facts. (Attached as Ex. 8.) In fact, Michelin's brief contains the totally inaccurate statement that in *Peterson*, "the Court considered the exact situation presented here." (Brief at 5, Doc. 203.) This assertion is completely false.

Peterson supports the use of FEA here. The *Peterson* order clearly states that plaintiffs' counsel failed to name Mr. Lee as an expert in the case. (Order at 2, 9-10, Ex. 8.) In our case, however, the problem was remedied: Mr. Lee was disclosed as an FEA expert and Michelin's counsel deposed him as to his FEA work. No such designation or deposition occurred in the *Peterson* case and the failure of the plaintiffs to do so was—as the court expressly noted—the fatal error. (*Id.* at 9-10)

As the Court noted in *Peterson*, Mr. Cottles does not hold himself out to be an expert in running and developing FEA models. (*Id.* at 8-9) Instead, Mr. Cottles is an expert in tire design. Mr. Cottles provided to Mr. Lee, who is an expert in FEA, the inputs that Mr. Cottles as a tire designer wanted evaluated using the FEA process. Mr. Cottles was named as an expert in tire design. Mr. Lee was named as an expert in FEA.

The entire *Peterson* order is based on the finding that (1) Mr. Cottles was not qualified to be the primary expert on FEA and (2) because Mr. Lee was not named as an expert in the case, there was no one available to establish the necessary foundation and to prove up the reliability of the FEA. (*Id.* at 8-11) Here, since Mr. Lee was appropriately named as an expert, the court's concern in *Peterson* are addressed. *Peterson* is inapposite.

V. Michelin's Affiant, Joseph Grant, Lacks the Technical Expertise to Criticize Mr. Lee's FEA Analysis.

In support of its motion, Michelin attaches the affidavit of one of its designated tire experts, Joseph Grant. Mr. Grant, however, lacks the technical expertise in FEA to offer the criticisms contained in his affidavit. During his deposition, Mr. Grant was asked some technical questions about modeling tires using FEA. In response, he admitted that he did not understand FEA. His exact testimony is as follows:

- Q. So what shape would you use to optimize it?
A. I wouldn't. I would leave it to someone who really understood what they're doing and just say my -- my experience and what I've seen in papers and in the work that I've worked with people who do finite element analysis, that was always a big concern.
Q. Were triangles?
A. Like I said, I wouldn't. I would leave it up to the people who really understood finite element analysis to break it down more appropriately.

(Grant Dep. at 332-33, Ex. 6.) Mr. Grant also admitted that he had not done any personal work with FEA since December 2005, when he left the tire industry. (*Id.* at 119.) Accordingly, in light of his admitted ignorance of the subject, Mr. Grant's detailed criticisms of Mr. Lee's FEA should be disregarded.

VI. The *Daubert* Standard for Admissibility of Expert Testimony Supports the Denial of Michelin's Motion.

The purpose of the *Daubert* inquiry “is to make certain that an expert, whether basing testimony upon professional studies or personal experience, employs in the courtroom the same level of intellectual rigor that characterizes the practice of an expert in the relevant field.” *Khumo Tire Co., Ltd. v. Carmichael*, 526 U.S. 137, 152, 119 S. Ct. 1167, 1176 (1999). *Daubert* is *not* intended to replace or short-circuit the adversarial process by having the Court decide among competing expert opinions. *See, e.g., Ruiz-Troche v. Pepsi-Cola of Puerto Rico Bottling Co.*, 161 F.3d 77, 85 (1st Cir. 1998) (“*Daubert* neither requires nor empowers trial courts to determine which of several competing scientific theories has the best provenance.”). Moreover, broad latitude should be provided where the defendant has the opportunity to call its own expert and vigorously challenge the opponent’s expert on cross-examination. *See Daubert v. Merrill Dow Pharm., Inc.*, 509 U.S. 579, 596, 113 S. Ct. 2786, 2798 (1993) (“Vigorous cross-examination, presentation of contrary evidence, and careful instruction on the burden of proof are the traditional and appropriate means of attacking shaky but admissible evidence.”). Michelin’s specific arguments relating to the admissibility of the FEA study are addressed below.

A. The FEA Analysis Is Clearly Relevant.

Michelin first argues that the FEA should be excluded because it is irrelevant. At the same time Michelin filed this current *Daubert* motion, it also filed a motion to exclude the testimony of Troy Cottles for his alleged failure to rely on any testing to support his nylon cap defect testimony. (Doc. 204.) This FEA study is clearly relevant to his testimony in this regard because it shows how the addition of a nylon cap ply and an increased belt width improves the endurance of the subject Laredo tire.

Michelin then argues that the FEA is irrelevant because Mr. Lee is not planning on testifying about tire design and there will be no expert to testify as to how the FEA relates to the design issues in the case. This silly argument ignores the reality of how the evidence will be admitted at trial. Mr. Lee can first testify and lay the foundation for the FEA study. He can answer all the questions about the variables and reliability of the FEA. After such a foundation is provided, Mr. Cottles can then testify as to what the actual results mean in terms of tire design. Handling the admission of the evidence in the manner should solve the supposed “problems” Michelin imagined in its motion.

B. Mr. Lee's FEA Is a Reliable Qualitative Analysis that Includes the Necessary Properties of the Tires Modeled.

Michelin also argues that Mr. Lee's FEA should be excluded because it does not meet the requirements for a proper "quantitative" analysis. This argument is troubling because Michelin knows that Mr. Lee did not purport to perform that type of analysis. Michelin knows that Mr. Lee's FEA sought to prove a "qualitative" (as opposed to "quantitative") comparison, because Mr. Lee said so during his deposition. (Lee Dep. at 74, Ex. 2.) Michelin also knows that Mr. Lee could not have performed a quantitative analysis because although Plaintiffs requested the information, Michelin refused to produce the information that would be needed for a quantitative analysis. (*Id.* at 74-75.)

In a qualitative analysis (the type of analysis Mr. Lee performed), the actual numerical values may not have significance. Instead, it is the relationship or difference between the output numbers that imparts the significance. For example, because Michelin refuses to produce the rubber recipe for its tires, Mr. Lee had to use a representative recipe in his model. Because that recipe was the same in both the subject tire and alternative design models, and Mr. Lee input all the other specific information regarding the tire that Michelin provided, the FEA can concentrate on the difference that the input change to the tire design makes in the overall results. The model does not predict the exact amount of change, but it does

predict whether the alternative tire will perform better, or worse, than the original tire. This is the analysis that Mr. Lee performed. Michelin's attempt to graft requirements from an entirely different analysis should be rejected for what they are—an attempt to confuse and distract the Court from the actual work that Mr. Lee performed.

Mr. Grant also agreed that Mr. Lee incorporated all of the information that Michelin produced into the FEA that he conducted. His specific testimony is as follows:

- Q. Now, you would agree that Mr. Lee would not have access to Michelin's skim stock recipe to incorporate in his finite element analysis; correct?
- A. Correct.
- Q. And that there are other material properties of the tire that because of confidentiality concerns tire makers such as Michelin do not produce in litigation?
- A. Correct.
- Q. Did you see anything in the documents that Michelin produced in this case that provided more detailed information from Mr. Lee to incorporate into his model that he did not use?
- A. I did not. No.

(Grant Dep. at 333-34, Ex. 6.) Michelin cannot use its refusal to provide more detailed tire information in discovery as a basis for excluding Mr. Lee's work.

C. The FEA Contains Appropriate Inputs.

Michelin also argues that Mr. Lee should have utilized several other inputs in his FEA study to properly generate “quantitative” results. Again, Mr. Lee never intended to perform a quantitative analysis. Instead, because he was performing a qualitative analysis, both tires were subject to the exact same conditions. In choosing the number of elements that were run in the computer model, he chose an amount similar to that he used when conducting FEA at Hankook. (Lee Dep. at 100, Ex. 2.) Michelin is merely nit picking Mr. Lee’s work, which is more appropriate for cross examination. There is nothing here that rises to the level of an appropriate *Daubert* motion.

D. The FEA’s Results Show the Improved Performance of the Alternative Design.

Michelin argues that because Mr. Lee changed more than one input in his alternative design, the results are too blurred to draw conclusion. This is another argument more appropriate for cross-examination. Design changes to a tire cannot be made in a vacuum. If one part of the tire is changed, other parts of the tire must also be redesigned so that the tire retains its proper shape and can still be modeled. Mr. Cottles provided two changes to the Laredo tire that he wanted modeled—addition of a nylon cap ply and increasing steel belt width. (Cottles Dep. at 98, attached as Exhibit 9.) Mr. Lee made these changes and two additional changes

that were required to make the tire so that it could be properly modeled as a tire. (Lee Dep. at 120, Ex. 2.) These changes were clearly detailed and reported. Mr. Lee discussed these changes and the reasons for them in his deposition. Michelin seeks to challenge the conclusions that Mr. Cottles can then draw from these results. This attack on Mr. Cottles' conclusion is clearly outside the scope of *Daubert*.

E. The FEA Software Was Properly Validated for the Type of Analysis Mr. Lee performed.

Michelin contends that the FEA software that Mr. Lee used in his analysis was not validated. This is incorrect. The FEA software that Mr. Lee used is the industry standard and has been validated by the numerous companies using it, including Hankook. (*Id.* at 118.) If Mr. Lee was conducting a quantitative analysis (which he is not), more validation might have been necessary, but there is no such requirement to validate the industry-approved software for performing the qualitative analysis that Mr. Lee performed. Again, Michelin creates an inapplicable standard and then complains that it is not met. The software is validated, and Mr. Grant agrees that Mr. Lee input all of the tire design information that Michelin produced. (Grant Dep. at 333-34, Ex. 6.)

F. The Alternative Design Tested in the FEA Performs its Intended Function.

Michelin has criticized the alternative design modeled in the FEA because it argues that the Plaintiffs have not proved that the modeled tire can actually be built purely on the specifications modeled. This criticism is yet another attempt to hold Plaintiffs' expert to a ridiculous standard that *Daubert* does not require.

No one has disputed the idea that it was feasible to add a nylon cap ply to the Uniroyal Laredo tire. Michelin manufactures numerous tires that contain nylon cap plies. Uniroyal first started manufacturing truck tires with nylon cap plies as early as 1989. (Patrick Dep. at 114, Ex. 7.)

In modeling an alternative design in FEA, Mr. Lee has not attempted to design an entirely new tire for Michelin. Plaintiffs lack the funding and resources to design and test completely new tires. Instead, the FEA is meant to model whether specific incremental changes will improve the safety and performance of the Laredo tire. The FEA model performs this task with appropriate scientific reliability. There is no requirement that Plaintiffs actually manufacture a production tire to demonstrate the alternative design, and Michelin knows it.

VII. Conclusion

For the foregoing reasons, Michelin's motion should be denied. Michelin's attempt to distort Mr. Lee's FEA should be rejected. Plaintiffs should not be

criticized for performing important scientific testing in support of their defect opinions.

Respectfully submitted, this 12th day of October, 2011.

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CERTIFICATE OF SERVICE

I hereby certify that on October 12, 2011, I electronically filed **Plaintiffs' Response to Defendant Michelin North America, Inc.'s Motion to Exclude Testimony of Troy Cottles and Don Lee Regarding Finite Element Analysis** with the Clerk of the Court using the CM/ECF system which will automatically send email notification of such filing to the following attorneys of record:

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